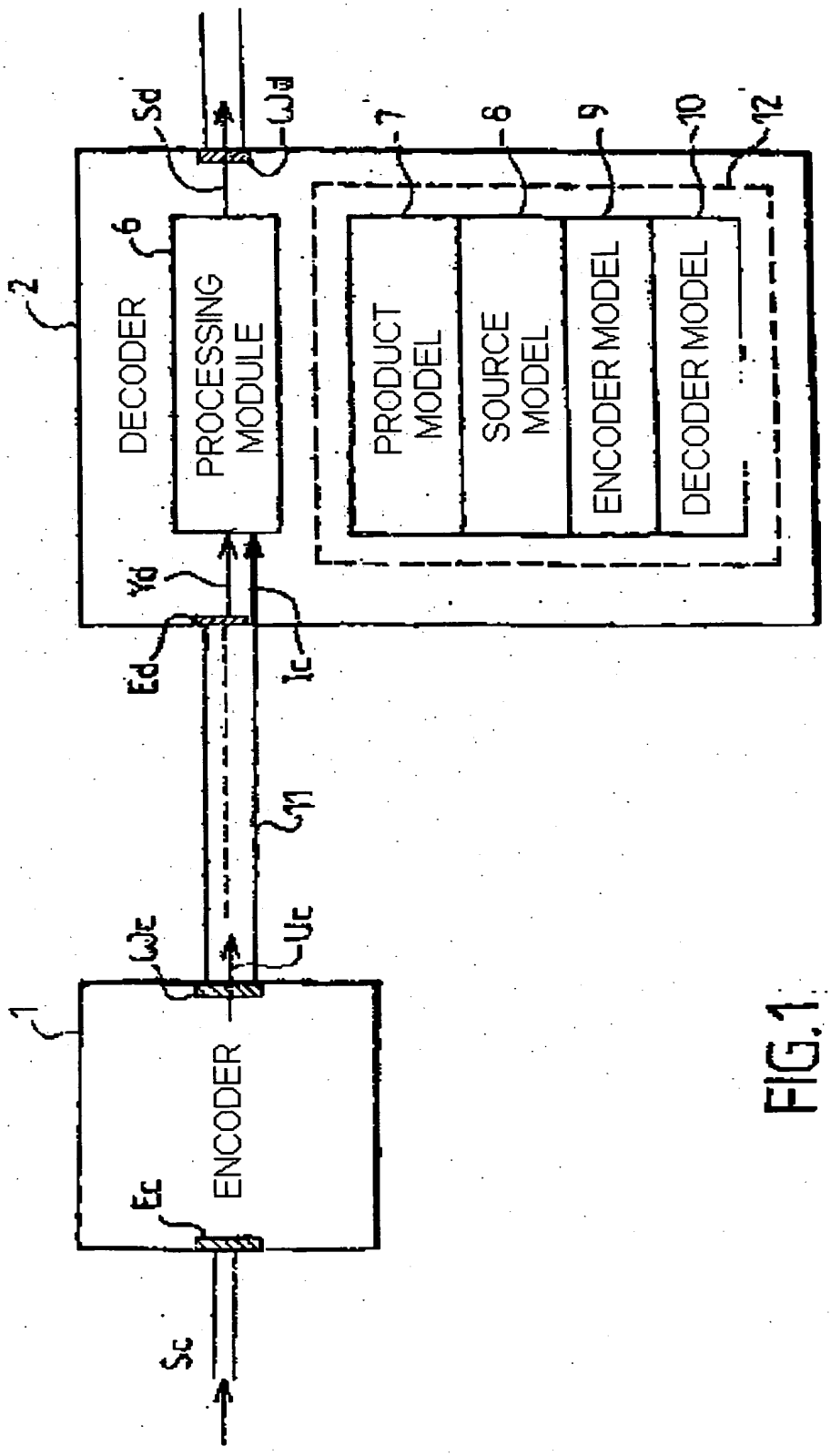

FIG.1

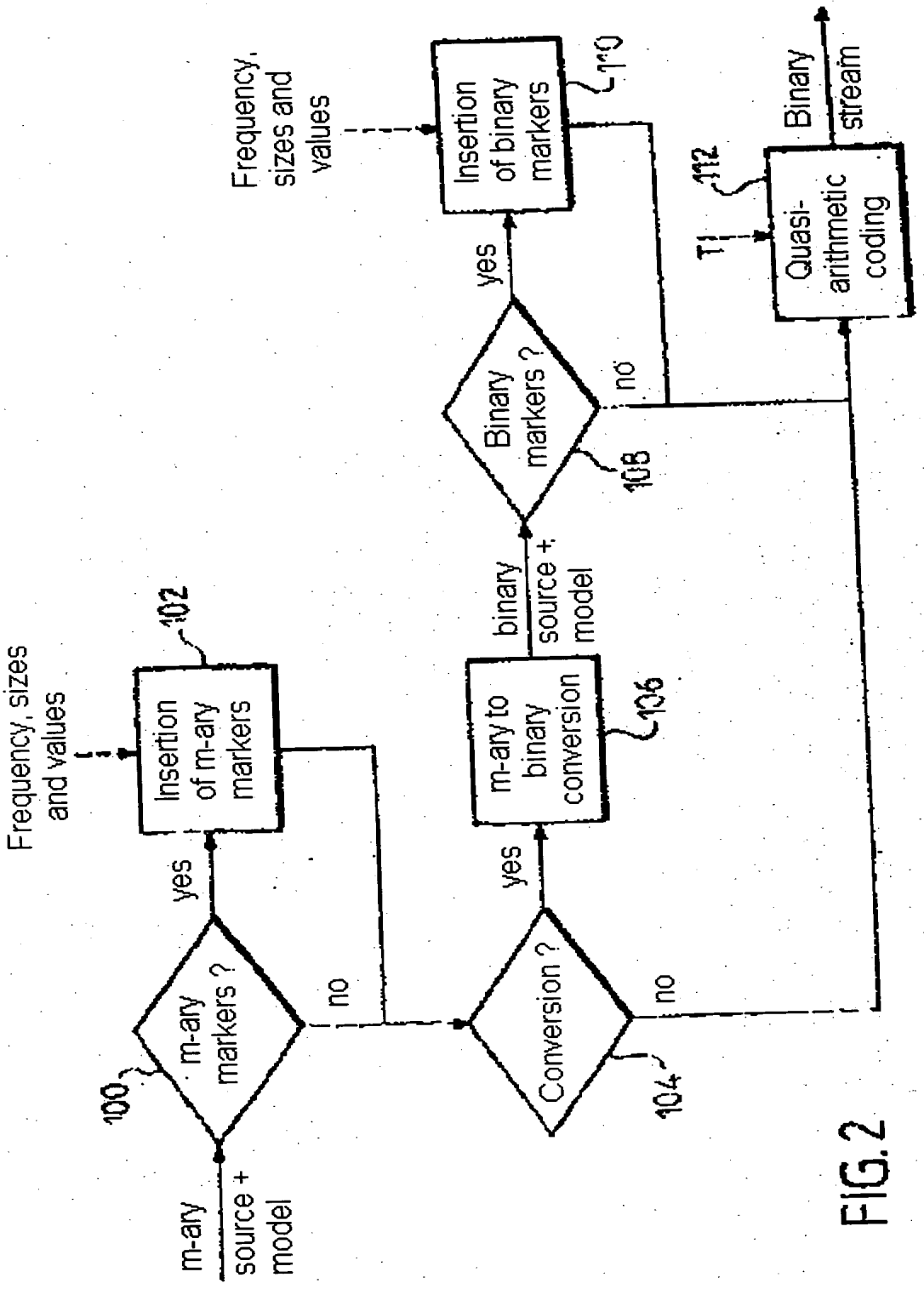
Frequency, sizes and values
Insertion of m-ary markers
102
m-ary markers ?
100
yes
no
m-ary source + model
m-ary to binary conversion
106
Conversion ?
104
yes
no
binary source + model
Insertion of binary markers
110
Frequency, sizes and values
Binary markers ?
108
yes
no
Quasi-arithmetic coding
112
T1
Binary stream

FIG.2

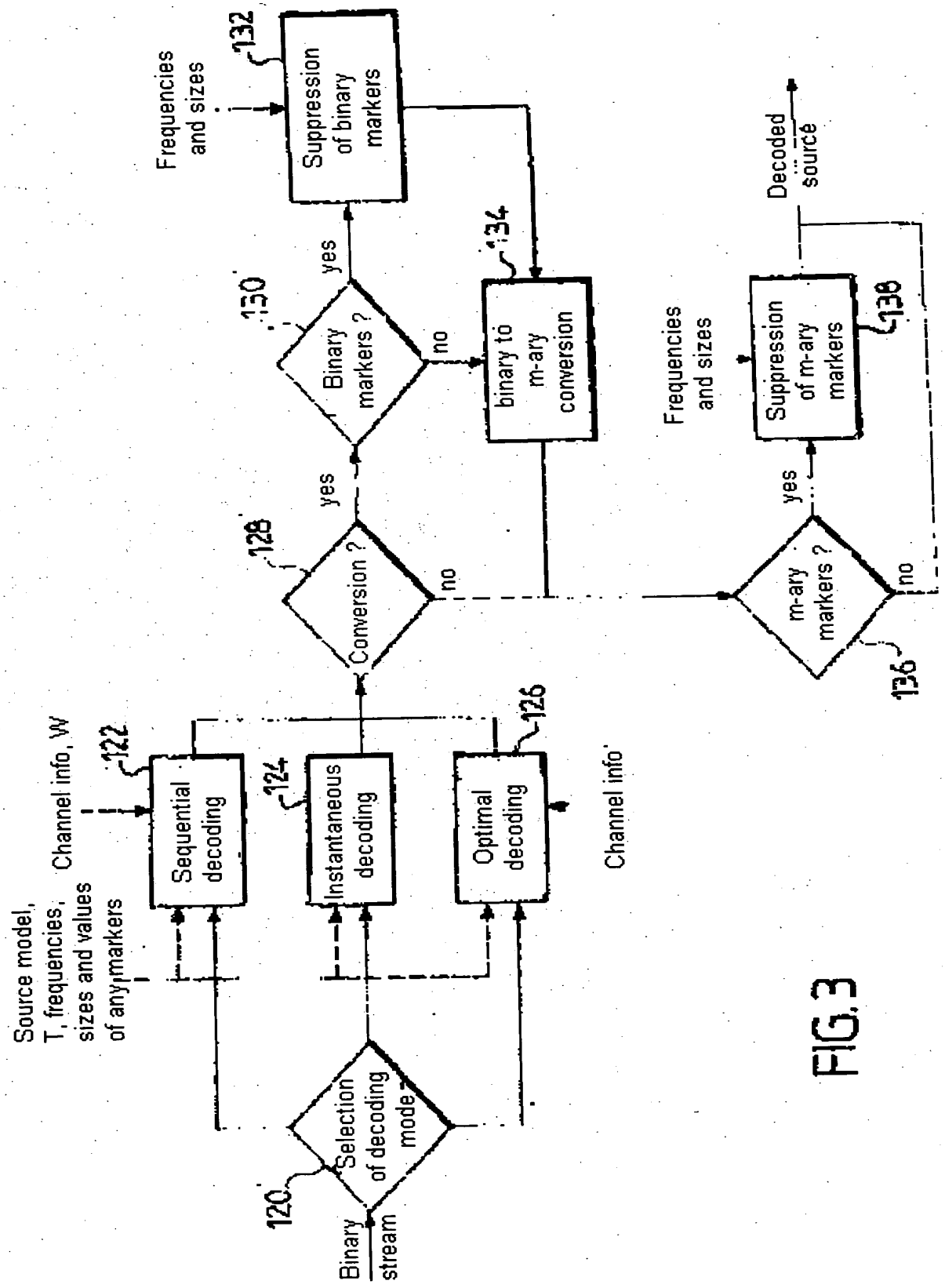
Frequencies and sizes
132
Suppression of binary markers
Decoded source
134
yes
150
Binary markers ?
no
binary to m-ary conversion
Frequencies and sizes
Suppression of m-ary markers
138
yes
yes
128
Conversion ?
no
m-ary markers ?
no
136
126
Channel info
Channel info, W
122
Sequential decoding
124
Instantaneous decoding
Optimal decoding
Source model, T, frequencies, sizes and values of any markers
Selection of decoding mode
120
Binary stream

FIG.3

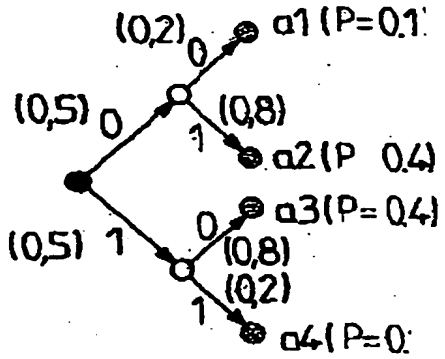

FIG. 4a

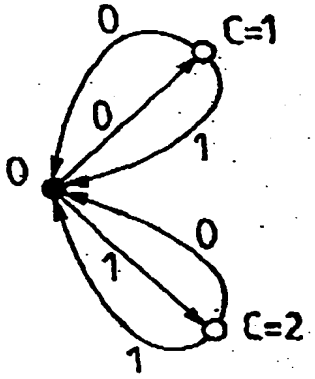

FIG. 4b

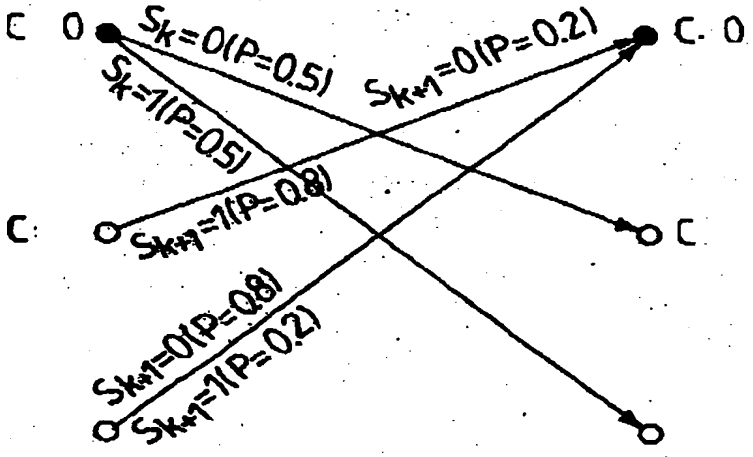

FIG. 4c

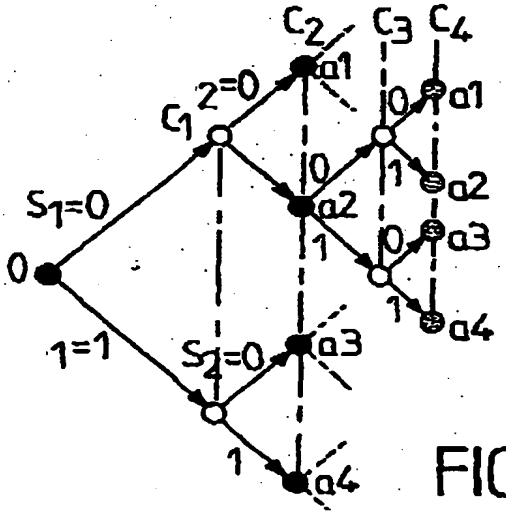

FIG. 5a

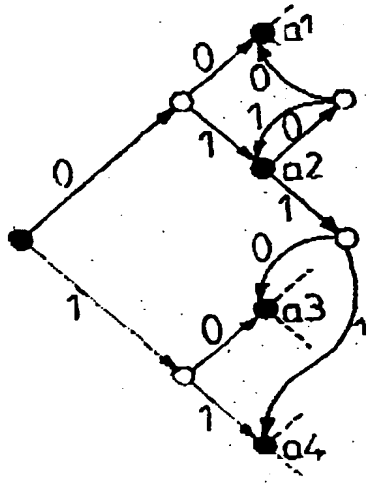

FIG 5b

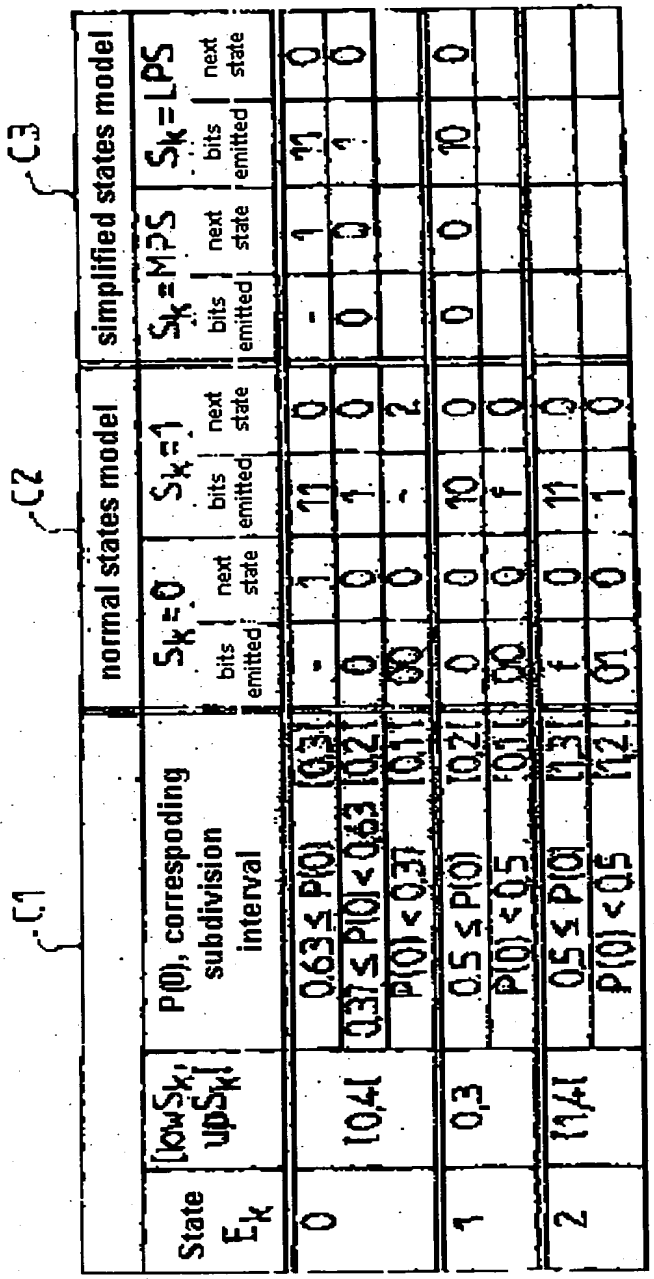

Table 1

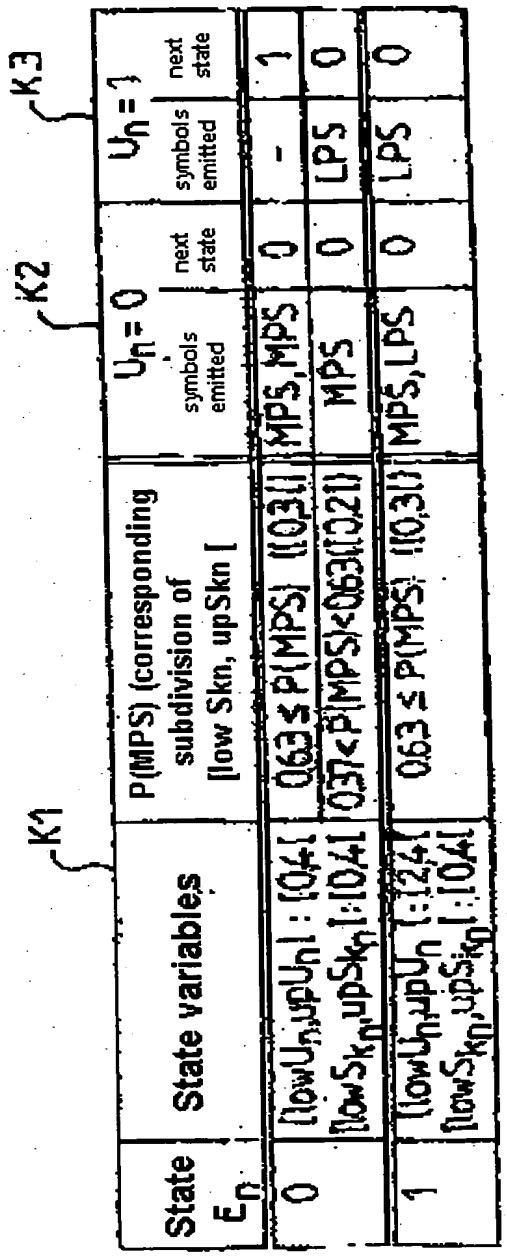

Table 2

State X_k	State variables	MPS	LPS
0 Initial state	[0,4[C=0	bits emitted:0 next state: 1	bits emitted: 1 next state: 2
1	[0,4[C=1	bits emitted:- next state: 3	bits emitted:11 next state: 0
2	[0,4[C=2	bits emitted:- next state: 3	bits emitted:11 next state: 0
3	[0,3[C=0	bits emitted: 0 next state: 1	bits emitted: 0 next state: 2

FIG.6A

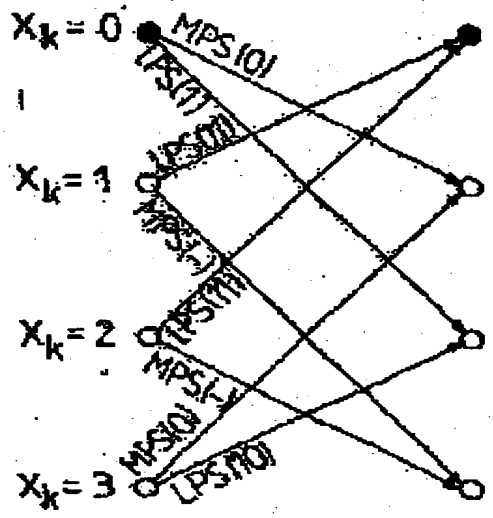

FIG.6B

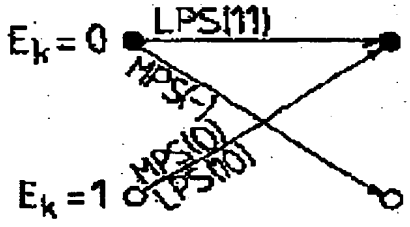

FIG.7A

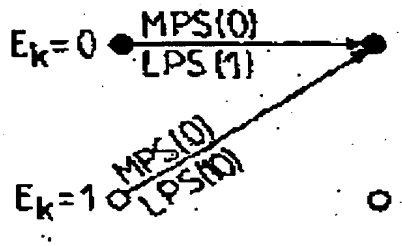

FIG.7B

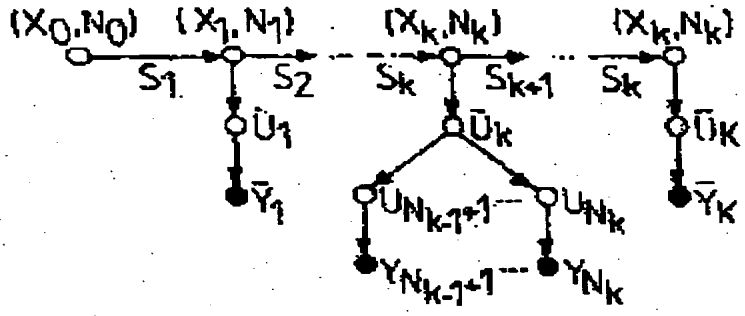

FIG.8

State X_k	State variables	$U_n = 0$	$U_n = 1$
0 Initial state	[0,4[[0,4[C=0	symbol emitted : MPS next state : 1	symbol emitted:LPS next state : 2
1	[0,4[[0,4[C=1	symb emitted:MPS,MPS next state : 1	symbol emitted: - next state : 3
2	[0,4[[0,4[C=2	symb emitted:MPS,MPS next state : 1	symbol emitted: - next state : 4
3	[2,4[[0,4[C=1	symb emitted:MPS,LPS next state : 2	symbol emitted: LPS next state : 0
4	[2,4[[0,4[C=2	symb emitted:MPS,LPS next state : 2	symbol emitted: LPS next state : 0

FIG.9a

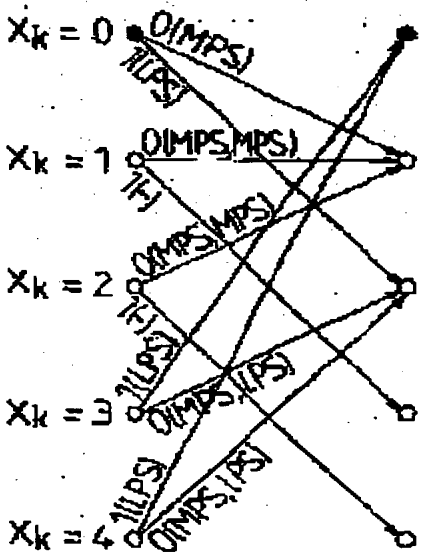

FIG.9b

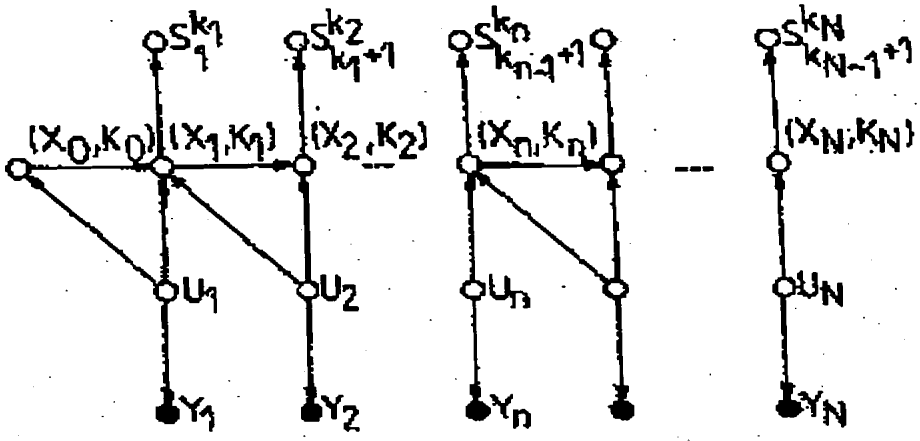
$S_1^{k_1}$
$S_{k_1+1}^{k_2}$
$S_{k_{n-1}+1}^{k_n}$
$S_{k_{N-1}+1}^{k_N}$
(X_0,K_0)
(X_1,K_1)
(X_2,K_2)
(X_n,K_n)
(X_N,K_N)
U_1
U_2
U_n
U_N
Y_1
Y_2
Y_n
Y_N

FIG.10

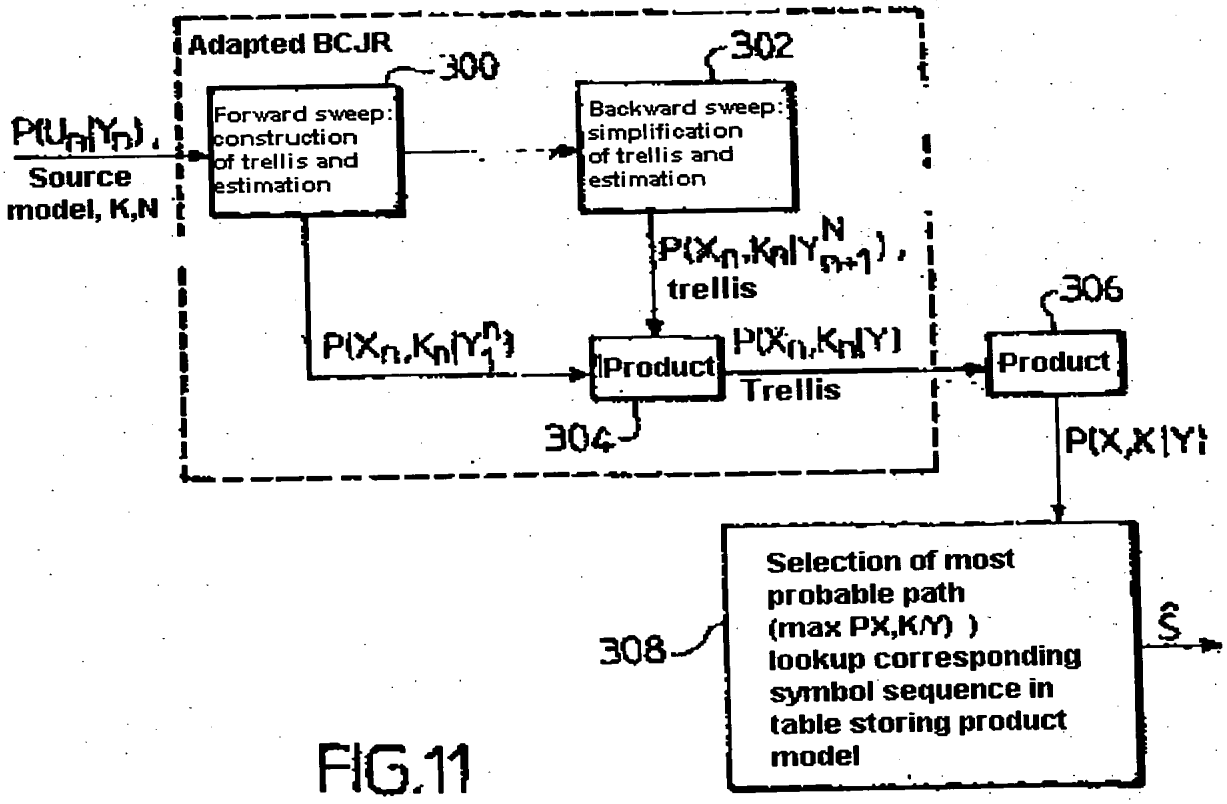
Adapted BCJR
300
302
$P(U_n|Y_n)$,
Source model, K,N
Forward sweep: construction of trellis and estimation
Backward sweep: simplification of trellis and estimation
$P(X_n,K_n|Y_{n+1}^N)$, trellis
306
$P(X_n,K_n|Y_1^n)$
Product
$P(X_n,K_n|Y)$
Trellis
Product
304
P(X,K|Y)
Selection of most probable path (max PX,K/Y)) lookup corresponding symbol sequence in table storing product model
308
$\hat{S}$

FIG.11

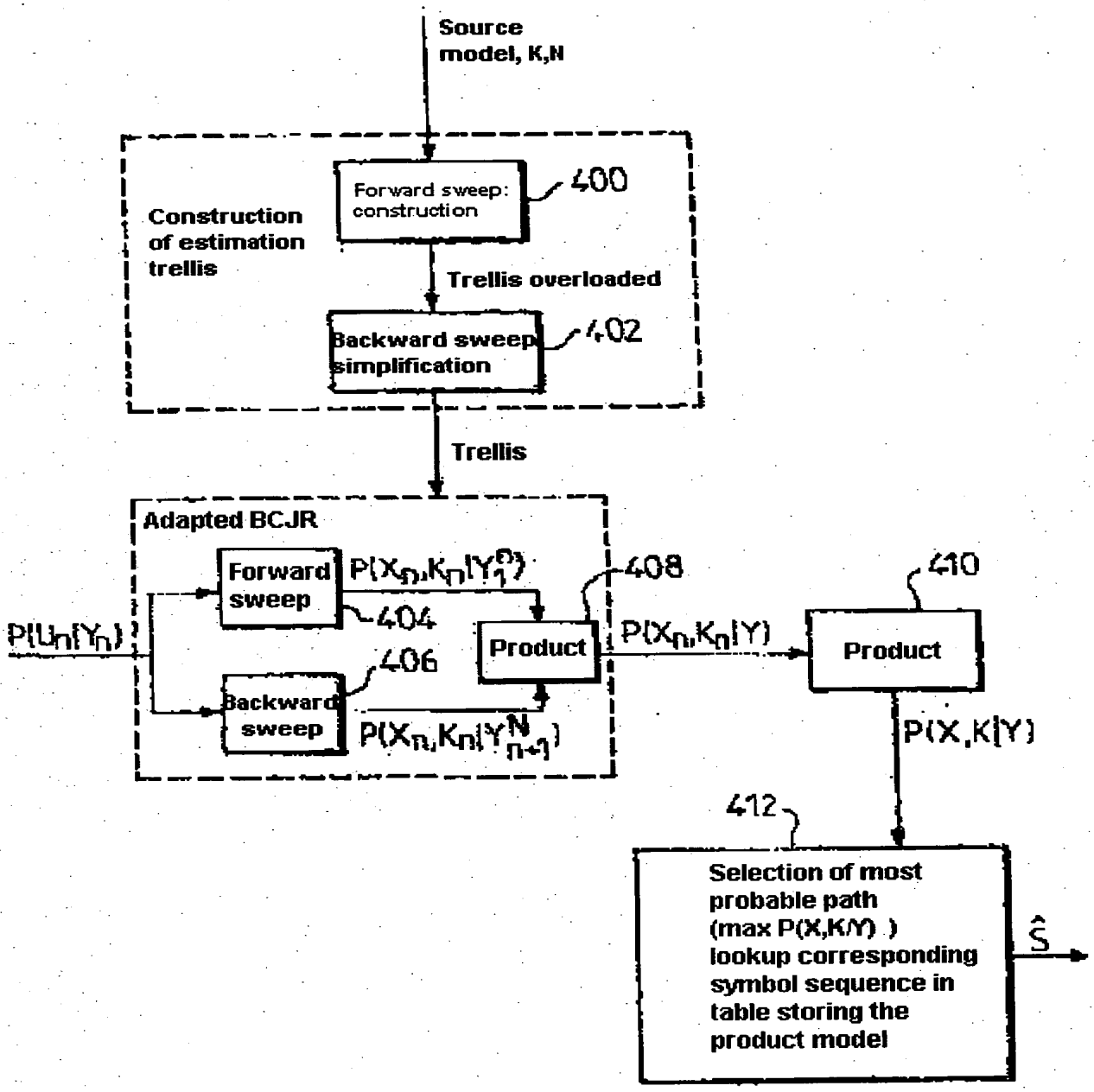
Source model, K,N
Construction of estimation trellis
Forward sweep: construction
400
Trellis overloaded
Backward sweep simplification
402
Trellis
Adapted BCJR
Forward sweep
$P(X_n,K_n|Y_1^n)$
404
$P(U_n|Y_n)$
Product
408
$P(X_n,K_n|Y)$
410
Product
406
Backward sweep
$P(X_n,K_n|Y_{n+1}^N)$
$P(X,K|Y)$
412
Selection of most probable path (max P(X,K/Y)) lookup corresponding symbol sequence in table storing the product model
$\hat{S}$

FIG.12

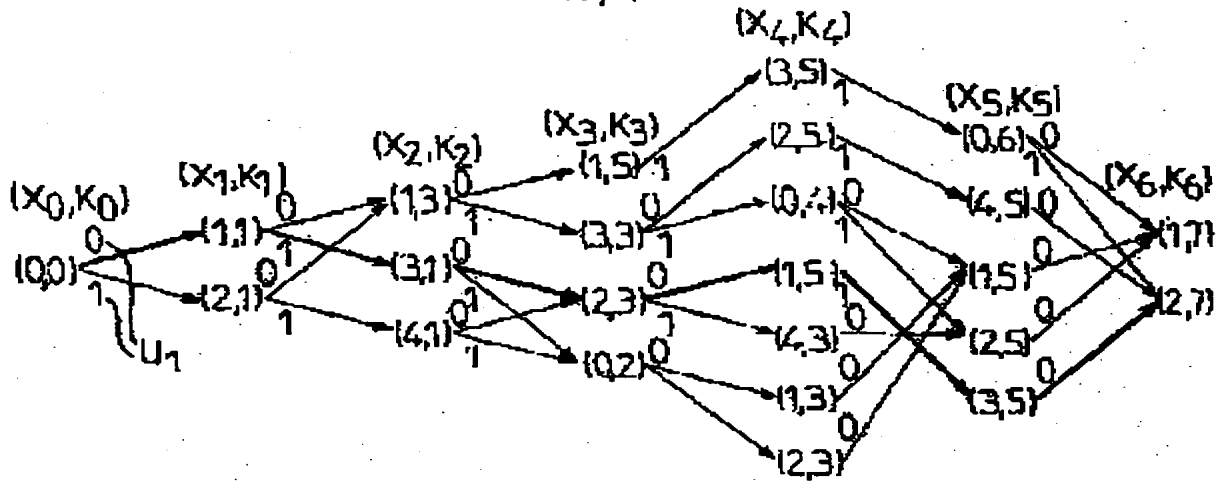

FIG.13

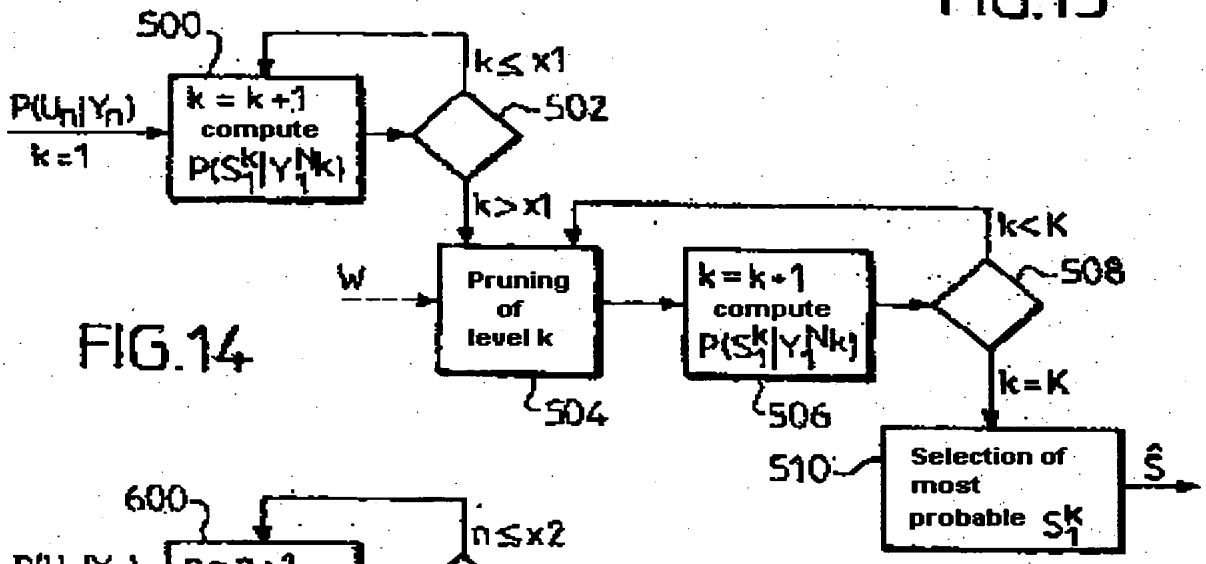

FIG.14

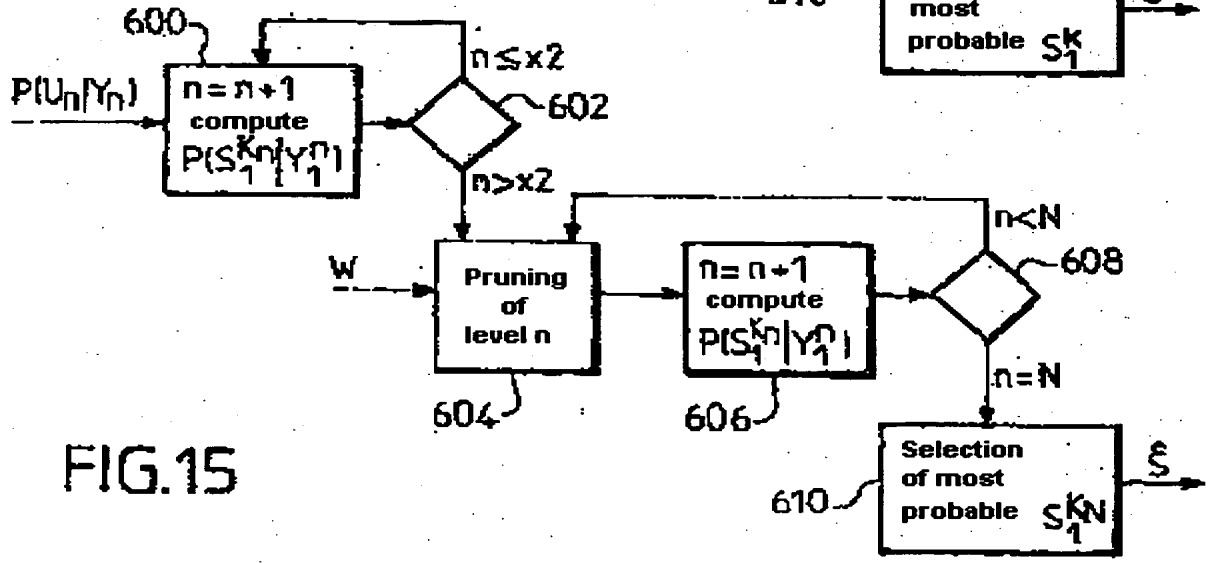

FIG.15